

REMARKS

Applicants have reviewed and considered the Office Action dated January 2, 2009 and the cited references therein. In that Action, Claims 1, 2, 6, 9-11, 13-23, and 47 have been rejected under 35 U.S.C. § 103. In view of the following remarks, reconsideration and allowance are respectfully requested.

Claim Rejections Under 35 U.S.C. 103

Claim rejections over Wolfinbarger, Jr. et al. in view of Wolfinbarger, Jr.

Claims 1, 2, 6, 9-11, 13-18, and 47 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Wolfinbarger, Jr. et al. (U.S. 5,977,432; hereinafter the “’432 Patent”) in view of Wolfinbarger, Jr. (U.S. 5,976,104; hereinafter the “’104 Patent”). Applicants respectfully traverse the rejection for at least the following reasons.

Claim 1 is directed to a process for inactivating and/or reducing pathogens from tissue having a plurality of cavities in which pathogens reside. The process comprises, in part, “centrifuging the tissue in a centrifuge with a flowing pathogen solvent reducing solution wherein the solution is flowed continuously to and away from the centrifuge containing the tissue during the centrifuging, the centrifuge producing a G force on the material to remove material from the tissue and promote penetration into the tissue.”

Neither the ’432 Patent nor the ’104 Patent, alone or in combination, teach or suggest “centrifuging the tissue in a centrifuge with a flowing pathogen solvent reducing solution wherein the solution is flowed continuously to and away from the centrifuge.” To develop an obviousness rejection of Claim 1, the Examiner modifies the teachings of the ’432 Patent with teachings from the ’104 Patent. The Examiner concedes that the ’432 Patent “is silent with respect to continuously flowing the solvent solution to and away from the centrifuge during the centrifuging.” Office Action, Page 3. The Examiner then asserts that the ’104 Patent teaches “another method of bone treatment wherein the solvent solution is flowed continuously to and way (sic) the treatment chamber, permitting complete removal of the bone marrow and continuous monitoring of bone marrow removal from the graft.” Office Action, Page 3.

Applicants respectfully submit that the combination of the '432 Patent and the '104 Patent is improper because the combination of the '432 Patent and the '104 Patent lacks a reasonable expectation of success. Applicants respectfully submit that the system of the '432 Patent would not be operable as the examiner has suggested if a solvent line was attached directly to the bone graft, as required by the teachings of the '104 Patent. Applicants also respectfully submit that the combination of the '432 Patent and the '104 Patent is improper because there is no motivation to combine the references at least because the combination would be redundant and would render one of the teachings superfluous.

The '432 Patent discloses a process for removal of bone marrow from the interstitial lumen and cancellous bone space by causing a flow of bone marrow from the cancellous bone space through creation of a centrifugational force. Col. 4, ll. 21-24. The process begins with a series of pre-cleaning, cleaning, and incubation procedures, including one or more of lavaging, soaking, sonicating, and agitating the cut bone grafts in cleaning solutions. Col. 7, ll. 52 – 61. The bone grafts are then transferred in a hydrogen peroxide solution to a centrifuge tube and centrifuged for a specified period of time. Col. 12, ll. 20-25. Subsequently, the bone grafts are removed from their centrifuge tubes and again cleaned. Col. 12, ll. 26-33. The bone grafts are then subjected to a series of washing solutions before experiencing another centrifuging process. Col. 12, ll. 34-59. Thus, the '432 Patent discloses a series of cleaning/incubating/washing procedures, wherein a substantial portion involves the treatment of a bone graft outside of a centrifuge.

The Examiner attempts to use the '104 Patent to remedy fundamental teaching deficiencies of the '432 Patent. The '104 Patent cannot be used to remedy the disclosure deficiencies of the '432 Patent at least because the combination is improper. While the Examiner has articulated some reasoning for combining the '432 Patent and the '104 Patent, the Applicants respectfully submit that the articulated reasoning of the Examiner ignores the explicit teachings of the '432 Patent and the '104 Patent.

The '104 Patent discloses a process for cleaning large bone grafts using a pressure mediated flow of solutions. Abstract. The process disclosed by the '104 Patent requires direct attachment of solvent lines to the bone grafts being cleaned. In fact, in each of the embodiments

and the eight examples disclosed, the '104 Patent consistently requires preparation of the bone for direct attachment of a solvent line or syringe. Specifically, the bone is prepared for attachment of a solvent line by drilling a small hole approximately midway between the proximal and distal ends or by transecting the whole bone approximately midway between the proximal and distal ends. Col. 5, ll. 36-40. The bone is attached to the solvent source and placed into the solvent solution in a sterile cleaning container. Col. 5, ll. 40-42. Solvent solution is then forced through the solvent line and the bone graft using an applied positive or negative pressure. See, Col. 5, li. 28 – Col. 6, li. 57. Because of the requirement of direct attachment, the '104 Patent further specifically teaches providing mechanical devices which permit attachment of solvent lines to the various large bone grafts being cleaned. Col. 2, ll. 52-54. Thus, the '104 Patent requires solvent line attachment directly to the bone graft and an application of positive or negative pressure.

In contrast, as discussed above, the '432 Patent teaches a process for removal of bone marrow from the interstitial lumen and cancellous bone space by causing a flow of bone marrow from the cancellous bone space through creation of a centrifugational force that requires placement of the bone in a centrifuge. It is unclear how a process using placement of a bone in a centrifuge could be modified with the teachings of a process requiring direct attachment of solvent lines to the bone.

Applicants respectfully assert that the combination of the '432 Patent and the '104 Patent is improper at least because the combination lacks a reasonable expectation of success. MPEP 2143.02 recites:

A rationale to support a conclusion that a claim would have been obvious is that all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded nothing more than predictable results to one of ordinary skill in the art.

As stated above, the '104 Patent requires solvent line attachment directly to the bone graft. Neither the '432 Patent nor the '104 Patent disclose how a centrifuge would be modified or developed allowing solvent line attachment directly to the bone graft that is positioned inside a centrifuge container and under the application of excess G forces. Furthermore, neither the

'432 Patent nor the '104 Patent disclose how a solvent line attachment directly to the bone graft that is positioned inside a centrifuge container would remain attached to the bone graft during application of the G forces created by the centrifuge. Simply stated, such system and method lack the requisite reasonable expectation of success for an obviousness combination.

According to MPEP § 2141.01, "[a]scertaining the differences between the prior art and the claims at issue requires interpreting the claim language, and considering both the invention and the prior art references as a whole" (emphasis added). The Examiner appears to be merely combining a reference that discloses the use of a centrifuge with a system that discloses the use of positive/negative pressure to induce flow through a bone graft without giving the proper consideration of the teachings of each of those references as a whole. The Examiner provides no explanation of how it would be obvious to one of ordinary skill in the art to develop and use as system requiring a solvent line attachment directly to the bone graft that is positioned inside a centrifuge container. Further, beyond not being obvious, Applicants assert such a system would not be operable as the Examiner has suggested if a solvent line was attached directly to the bone graft.

Furthermore, one skilled in the art would not have been motivated, at the time of Applicants' invention, to combine the teachings of the '432 and '104 Patents. The '104 Patent requires the application of positive or negative pressure to the bone graft. Such pressure is applied to push (or pull) a solvent through the bone graft. Similarly, centrifugal pressure causes a centrifugational induced flow of solvent through the bone. Even if possible, which as discussed above, Applicants believe it is not, one skilled in the art would recognize that adding a centrifuge to the method disclosed in the '104 Patent, which requires the application of positive or negative pressure, would render the application of positive and/or negative pressure, and thus the teachings of the '104 Patent, redundant. Thus, one skilled in the art would not have been motivated to combine the application of positive or negative pressure to the bone graft in addition to the G forces acted on the bone graft while being centrifuged. Indeed, this is reinforced by the fact that the '104 Patent is incorporated in its entirety into the specification of the '432 Patent, yet no such combination of the application of positive or negative pressure to the bone graft in addition to, or alternatively in lieu of, the G forces acted on the bone graft while being centrifuged is taught or suggested.

Thus, Claim 1 is not made obvious by the '432 Patent in view of the '104 Patent. Claims 2, 6, 9-11, 13-18, and 47 depend from Claim 1 and are patentable for the same reasons as Claim 1 and for the additional limitations recited therein. Reconsideration and withdrawal of the rejection are respectfully requested.

Claim rejections over Wolfinbarger, Jr. et al. and Wolfinbarger, Jr. in view of Morris et al.

Claims 19, 22, and 23 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over the '432 Patent and the '104 Patent, as applied to Claim 17 above, and further in view of Morris et al. (WO 01/58497). Applicants respectfully traverse the rejection for at least the following reasons.

Claims 19, 22, and 23 depend from Claim 1. As stated above, neither the '432 Patent nor the '104 Patent, alone or in combination, teach or suggest "centrifuging the tissue in a centrifuge with a flowing pathogen solvent reducing solution wherein the solution is flowed continuously to and away from the centrifuge."

Morris et al. fail to remedy the fundamental disclosure deficiencies of the '432 and '104 Patents. Morris et al. disclose an apparatus for treating the interior of a fluid permeable workpiece by establishing a pulsatile flow of fluid using pressure differentials. More specifically, in the method of Morris et al., an end of a bone is placed in a first chamber and another end of the bone is placed in a second chamber. Page 12. Alternating pressure cycles between the first chamber and second chamber is then provided to achieve a pulsatile type flow through the bone. Page 12. Morris et al. do not teach nor suggest continuously flowing a liquid. Accordingly, Morris et al. do not teach nor suggest "centrifuging the tissue in a centrifuge with a flowing pathogen solvent reducing solution wherein the solution is flowed continuously to and away from the centrifuge."

Thus, Claims 19, 22, and 23 are not made obvious by the '432 and '104 Patents in view of Morris et al. Reconsideration and withdrawal of the rejection are respectfully requested.

Claim rejections over Wolfinbarger, Jr. et al. and Wolfinbarger, Jr. in view of
Wolfinbarger, Jr. et al.

Claims 20 and 21 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over the '432 Patent and the '104 Patent, as applied to Claim 17 above, and further in view of Wolfinbarger, Jr. et al. (US 6,293,970; hereinafter the "'970 Patent").

Claims 20 and 21 depend from Claim 1. As stated above, neither the '432 Patent nor the '104 Patent, alone or in combination, teach or suggest "centrifuging the tissue in a centrifuge with a flowing pathogen solvent reducing solution wherein the solution is flowed continuously to and away from the centrifuge."

The '970 Patent fails to remedy the fundamental disclosure deficiencies of the '432 and '104 Patents. The '970 Patent discloses a plasticized dehydrated or freeze-dried bone and/or soft tissue product. Abstract. The Examiner cites the '970 Patent for disclosing a process of sterilizing a bone graft followed by infusion with a plasticizer and that the plasticizer may be effective in improving graft brittleness. Even were the '970 Patent to teach what the Examiner suggests, the '970 Patent does not teach nor suggest "centrifuging the tissue in a centrifuge with a flowing pathogen solvent reducing solution wherein the solution is flowed continuously to and away from the centrifuge," as recited by Claim 1.

Thus, Claims 19, 22, and 23 are not made obvious by the '432 and '104 Patents in view of the '970 Patent. Reconsideration and withdrawal of the rejection are respectfully requested.

Conclusion

Applicant submits herewith a Petition for Extension of Time and authorizes the Commissioner to charge the fee of \$65.00 to Deposit Account No. 04-1420.

The Commissioner is authorized to charge any additional fees, including extension fees or other relief which may be required, or credit any overpayment and notify us of same, to Deposit Account No. 04-1420.

This application now stands in allowable form and reconsideration and allowance is respectfully requested.

Respectfully submitted,

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